

WHAT IS CLAIMED IS:

- 1                   1.       A component transfer device, comprising:  
2                               a roller device adapted for moving a liner having a plurality of  
3 components removably adhered thereto;  
4                               a gripper adapted for selectively gripping the liner; and  
5                               a placement actuator adapted for engaging a desired component of the  
6 plurality of components, the placement actuator further adapted for placing the desired  
7 component on a target device;  
8                               wherein the gripper and placement actuator are removably coupled  
9 with a coupler, the coupler adapted for moving the placement actuator when the roller device  
10 moves the liner.
- 1                   2.       The component transfer device as in claim 1 wherein the gripper and  
2 placement actuator move about a same linear distance when the roller device moves the liner.
- 1                   3.       The component transfer device as in claim 1 further comprising a base  
2 against which the liner is gripped by the gripper, the base comprising a peel edge over which  
3 the liner is moved.
- 1                   4.       The component transfer device as in claim 3 wherein the peel edge is a  
2 fixed peel edge.
- 1                   5.       The component transfer device as in claim 3 wherein the roller device  
2 comprises a pinch roller, and wherein the base is disposed between the pinch roller and the  
3 gripper.
- 1                   6.       The component transfer device as in claim 1 further comprising a  
2 tension device adapted to provide a back pressure generally resistive to the roller device  
3 moving the liner.
- 1                   7.       The component transfer device as in claim 1 wherein the placement  
2 actuator comprises a vacuum head for engaging the desired component.
- 1                   8.       The component transfer device as in claim 7 wherein the vacuum head  
2 comprises a hole pattern having a same general shape as the desired component.

- 1                   9.       The component transfer device as in claim 1 further comprising a  
2   sensor adapted for sensing a position of the desired component on the liner.
- 1                   10.       The component transfer device as in claim 9 wherein the sensor is  
2   further adapted for sensing a position on the liner of a next component to be transferred.
- 1                   11.       The component transfer device as in claim 9 further comprising a gas  
2   jet adapted for directing a gas towards the liner to bias the liner towards a base when the  
3   sensor is sensing the position of the desired component.
- 1                   12.       The component transfer device as in claim 1 wherein the liner  
2   comprises a release liner for removably adhering the plurality of components thereto.
- 1                   13.       The component transfer device as in claim 1 wherein at least some of  
2   the plurality of components are adhesive components removably adhered to the liner.
- 1                   14.       The component transfer device as in claim 1 wherein the placement  
2   actuator is adapted to engage the desired component while the desired component is adhered  
3   to the liner.
- 1                   15.       The component transfer device as in claim 1 wherein the actuator is  
2   adapted to retain the desired component when the liner is moved over a peel edge.
- 1                   16.       The component transfer device as in claim 1 wherein the actuator is  
2   adapted to rotate the desired component before placing the desired component on the target  
3   device.
- 1                   17.       The component transfer device as in claim 1 further comprising a print  
2   head adapted to print on the desired component when the desired component is on the liner.
- 1                   18.       The component transfer device as in claim 1 further comprising a  
2   controller coupled to the roller device for controlling the liner movement.
- 1                   19.       The component transfer device as in claim 18 wherein the controller is  
2   further coupled to the gripper.

1                   20.     The component transfer device as in claim 1 further comprising a  
2 stroke actuator coupled to the placement actuator and adapted for positioning the placement  
3 actuator relative to the target device.

1                   21.     The component transfer device as in claim 1 wherein the gripper and  
2 placement actuator are fixedly coupled together.

1                   22.     The component transfer device as in claim 1 further comprising at least  
2 one stop, the stop positioned to engage the placement actuator at a desired location relative to  
3 the target device.

1                   23.     A component transfer device comprising:  
2                               means for moving a liner over a peel edge, the liner having a plurality  
3 of components removably adhered thereto;  
4                               a placement device adapted for engaging a first component of the  
5 plurality of components while the first component is adhered to the liner at a first location;  
6 and  
7                               a gripper adapted for gripping the liner at a second location;  
8                               wherein the gripper and placement device are adapted for moving  
9 about a same linear distance when the liner is moved.

1                   24.     The component transfer device as in claim 23 wherein the placement  
2 device is adapted to retain the first component when the first location passes over the peel  
3 edge separating the first component from the liner, the retained first component having a  
4 same general shape both before and after removal from the liner.

1                   25.     The component transfer device as in claim 23 further comprising a  
2 sensor adapted to sense a position of a second component on the liner.

1                   26.     The component transfer device as in claim 23 wherein the placement  
2 device is further adapted to place the first component on a target.

1                   27.     A method of transferring components from a liner to a desired target,  
2 the method comprising:  
3                               positioning the liner at a desired position;

4                   engaging the liner with a gripper and with a placement actuator, the placement  
5 actuator engaging a desired component that is removably adhered to a first portion of the  
6 liner;

7                   moving the liner so the first portion passes over a peel edge, wherein the  
8 gripper and the placement actuator move with the liner;

9                   retaining the desired component with the placement actuator and removing the  
10 desired component from the liner when the first portion passes over the peel edge;

11                  providing relative movement between the placement actuator retaining the  
12 desired component and the desired target, to couple the desired component and the desired  
13 target.

1                   28.     The method as in claim 27 wherein the desired component remains  
2 substantially free of deformations when retained by the placement actuator compared to the  
3 desired component shape when adhered to the liner.

1                   29.     The method as in claim 27 wherein retaining the desired component  
2 with the placement actuator comprises applying a negative pressure to the desired component  
3 using a plurality of vacuum holes in the placement actuator.

1                   30.     The method as in claim 27 wherein providing the relative movement  
2 comprises a movement of the placement actuator.

1                   31.     The method as in claim 27 wherein providing the relative movement  
2 comprises a movement of the target device.

1                   32.     The method as in claim 27 further comprising sensing a location of the  
2 desired component on the liner before engaging the desired component with the placement  
3 actuator.

1                   33.     The method as in claim 32 further comprising directing a gas towards  
2 the liner to help hold the liner first portion substantially flat relative to the sensor when  
3 sensing the location of the desired component.

1                   34.     The method as in claim 27 further comprising controlling a second  
2 movement of the placement actuator to align the retained desired component and the desired  
3 target.

1                    35.     The method as in claim 27 further comprising retaining a second  
2     desired target with the placement actuator, and coupling the second desired target to the  
3     desired component while the desired component is adhered to the liner.

1                    36.     The method as in 35 further comprising coupling the desired  
2     component to the desired target after coupling the second desired target to the desired  
3     component.

1                    37.     The method as in claim 27 further comprising printing on the desired  
2     component while the desired component is adhered to the liner.

1                    38.     The method as in claim 27 wherein the gripper and the placement  
2     actuator move about a same linear distance when the liner is moved.